

Chromalox®

Installation and Operating Instructions

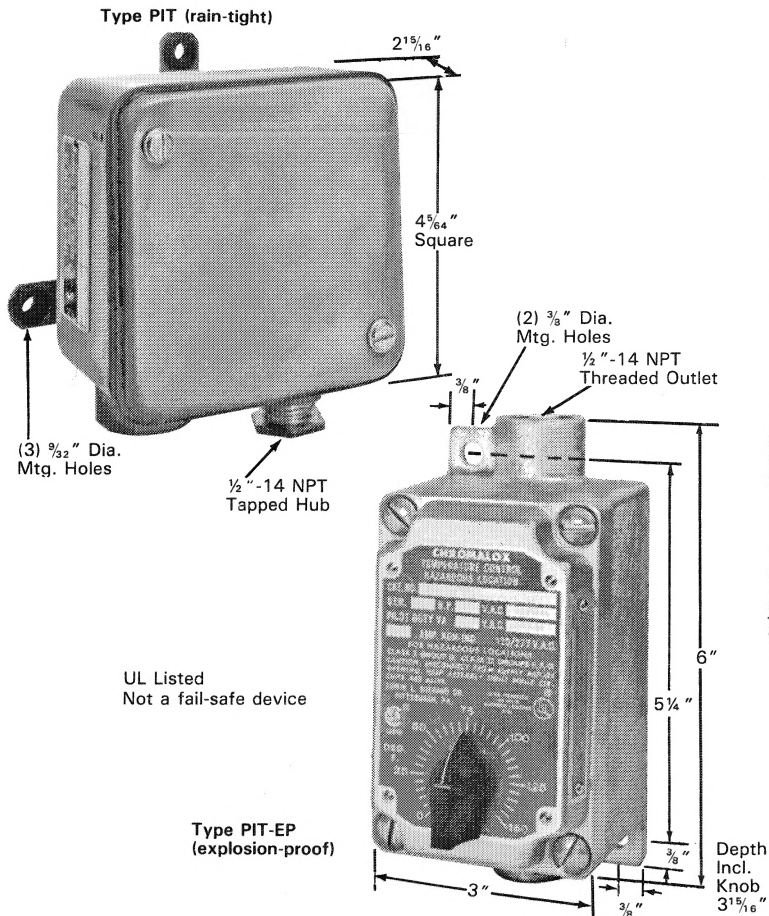
SERVICE REFERENCE

DIV. 4	SEC. PIT	NUMBER 3001E
SALES REFERENCE	(Supersedes PK428-4)	PK428-5
		161-048628-001
DATE	OCTOBER, 1987	

Chromalox General Purpose Industrial Thermostat

Catalog Number PIT with Rain-Tight Enclosure

Catalog Number PIT-EP with Explosion-Proof Enclosure



Specifications — Table A

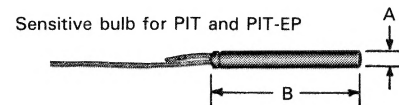
Catalog Number (Rain-Tight)	Catalog Number (Explosion-Proof)	Temp. Range (°F)	Sensitive Bulb with 10' Capillary 1/16\" dia.		Nominal* Differential (°F)
			"A" Dia.	"B" Lgth.	
PIT-15	PIT-15EP	0-150°	.290"	2 1/2"	6
PIT-25	PIT-25EP	100-250°	.290"	2 1/2"	6
PIT-35	PIT-35EP	200-350°	.366"	2 1/4"	6
PIT-50	PIT-50EP	325-475°	.366"	2 1/4"	6

*Differential based on direct bulb immersion in liquid at 1° per minute rate of change. In a bulb well, differential will widen. When clamped to a surface such as a pipe, differential may be wider or narrower depending on several variables.

Electrical Ratings — Table B

Voltage, A.C. Only	120	208	240	277
Full Load Amperes	16	9.2	8	—
Locked Rotor Amperes	96	55.2	48	—
Non-Inductive or Resistance Load Amperes* (Not Lamp Loads)	22	22	22	22
Pilot Duty — 125 VA, 24/600V. A.C.				

*S.P.S.T. Rating



GENERAL

NOTICE: Type PIT controls are designed for temperature control service only. Because they do not fail safe, they should not be used for temperature limiting duty.

APPLICATION — Chromalox Type PIT SPDT thermostats are designed for a variety of applications where Rain-tight or Explosion-proof enclosures are necessary or desirable. Typical use is to control the temperature of fluids conveyed through pipes (commonly termed pipe tracing), also used in snow melting applications with electric heating cable. An alarm or signal circuit can be operated by the auxiliary contacts.

CAUTION: Rain-Tight models are not for use in hazardous environments as described in National Electrical Code. Failure to comply can result in explosion or fire.

CAUTION: Users should install adequate controls and safety devices with their electric heating equipment. Where consequences of failure may be severe, back-up controls are essential. Although the safety of the installation is the responsibility of the user, Chromalox will be glad to make equipment recommendations.

Type PIT — Rain-tight, gasketed enclosure is 0.062" steel. Simple mounting on 3 rubber-cushioned feet. Has adjustable high limit stop. Plain copper bulb and capillary.

Type PIT-EP — Explosion-proof, cast aluminum housing approved for Class I, Group D and Class II, Groups E, F, G. External adjusting knob. Tin-plated copper bulb and capillary.

Can either open or close a circuit on temperature rise. SPDT, snap-acting switch.

GENERAL (continued)

Principle of Operation — Control action of these thermostats is provided through the principle of liquid volume change. With a variation in temperature, the liquid in the sensing bulb expands or contracts, causing a bellows to actuate the switching mechanism.

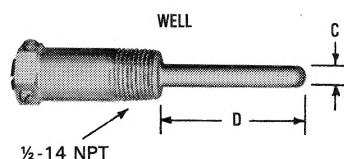
Power Supply — **WARNING:** Use on AC only. Thermostat is not DC rated.

The Rain-tight models only have a keyed adjustable high limit stop. A special wrench is required to adjust this limit stop and is supplied with each control.

High Limit Stop Adjustment — The high limit stop can be set at any position between 55 °F. above the lowest dial range and the highest dial range. For example: The high limit stop can be set between 55 °F. and 150 °F. on a thermostat with a range of 0 °F. to 150 °F.

To change the stop setting, loosen the two screws in the dial plate with the wrench packed with the control. Turn the dial so the pointer indicates the stop setting. Move the stop (located behind dial plate) against stop bracket. Tighten screws to lock the stop in position.

OPTIONAL ACCESSORY — Bulb Well — Copper bulb wells with ½" NPT brass connectors are supplied when specified. See Specifications for Catalog Numbers. Table C.



Bulb Wells — Table C

For Bulb Dia.	Catalog Number	"C" Dia.	"D" Length
.290	CPWC-1	3/8"	2 3/8"
.366	CPWC-2	7/16"	2 13/16"

MOUNTING

NOTE: Do not mount control where it will be subject to vibration, shock, grease, or corrosive vapors. Do not mount adjacent to a large magnetic contactor, as vibration and shock will cause thermostat to interact erratically — resulting in chattering of the contactor.

The air temperature in and around the control enclosure should be kept as near to normal room temperature as possible...never above 150 °F.

Indoors, the thermostats may be mounted in any position.

RAIN-TIGHT ENCLOSURE TYPE PIT — Outdoors, where exposed directly to weather, the electrical connection and capillary should be on the lower horizontal surface as illustrated in Figure 1.

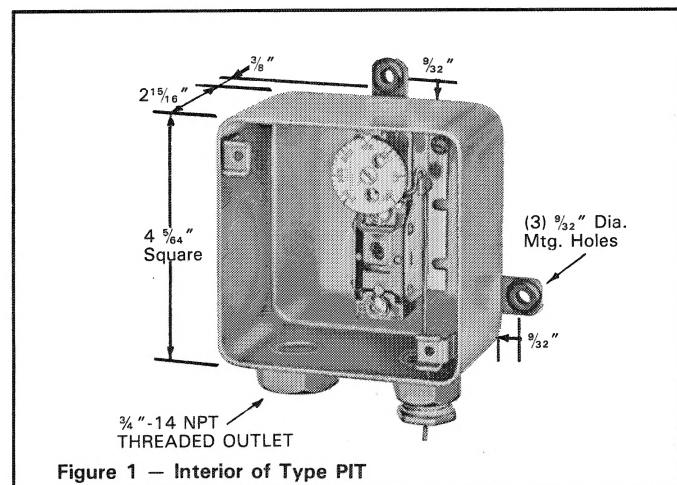


Figure 1 — Interior of Type PIT

Adjustments — The setting may be changed to meet the requirements of the installation. To change setting, remove the cover and rotate dial with a screwdriver.

Where the capillary is exposed and subject to possible mechanical damage, some means of protection should be provided. The capillary outlet is designed to permit the capillary to run through ½" thinwall conduit or through metal hose such as 3/8" Anaconda "Sealtite" or equivalent.

Remove the capillary outlet seal nut only, see Figure 2. Push the bulb and capillary through a conduit coupling or suitable hose fitting and on through the conduit or hose. By tightening the conduit coupling or hose fitting to the ½" female capillary outlet fitting, the seal around the capillary will be maintained and the conduit or hose will be rigidly attached to the enclosure.

The end of the conduit or hose away from the control should be clamped and bushed and the capillary should be taped to prevent cutting or wear from sharp edges and any strain on the capillary.

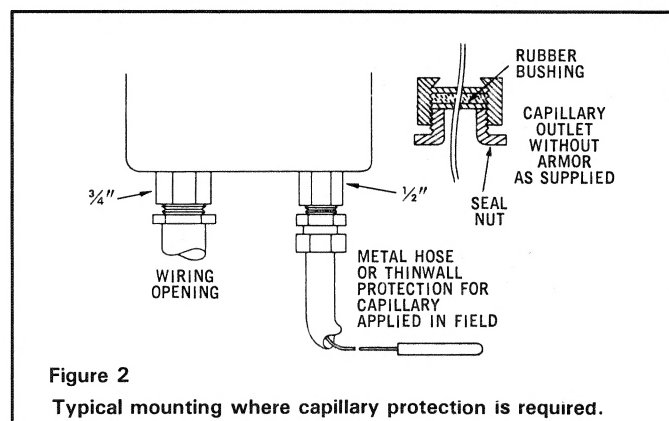


Figure 2

Typical mounting where capillary protection is required.

NOTICE —

- A. Bending or deforming sensing bulb will alter control calibration.
- B. Do not kink capillary tube. The resulting constrictions in fluid flow can destroy control function or broaden temperature differential. Minimum capillary tube bending diameter is ½" I.D. (See Figure 4)
- C. Any deformations of bulb or capillary that result in leakage of fluid from control renders control inoperative.

Figure 3
(Sensing Bulb)

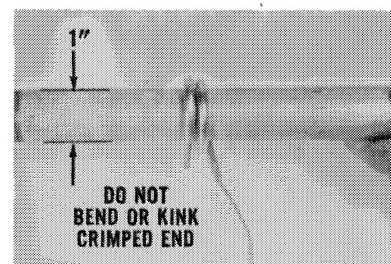
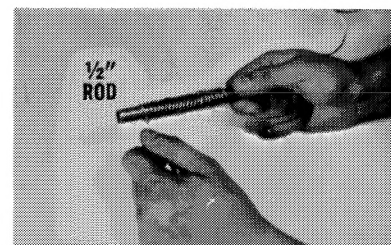


Figure 4
(Capillary Tube)



- D. Avoid passing control capillary tube through zones whose temperature is in excess of controlled process temperature. Erratic control or destruction of control function may result.

WIRING

CAUTION: Hazard of electric shock. Disconnect all power before wiring or servicing this control. Failure to comply can result in electrical shock or electrocution.

1. Electric wiring to heater must be installed in accordance with local and National Electrical Codes. **WARNING:** Use copper conductors only.
2. The Chromalox Type PIT Thermostat has an enclosed SPDT switch contact unit. Wiring terminals are accessible by removing the cover and may be wired to open on temperature rise (Red to Blue), or to close on temperature rise (Red to Yellow). See Figure 5.
3. **Signal Circuit** — Self contained pilot lamps are not available. Remote lights or other type of signal circuits may be connected as shown in Figure 6.
4. Connect wires according to wiring diagrams (Figures 6 thru 8). **Note:** Electrical connections should be made with generous loops of wire — approximately 6" per lead.
5. Replace cover, tighten screws, replace dial knob and dial knob cover.
6. Note: On a three phase load or if load amperage or voltage rating exceeds switch rating, a contactor must be used. (See Figure 8) Contactor and wiring to be supplied by customer.

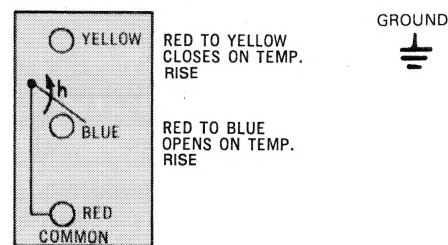


Figure 5 — Terminal arrangement

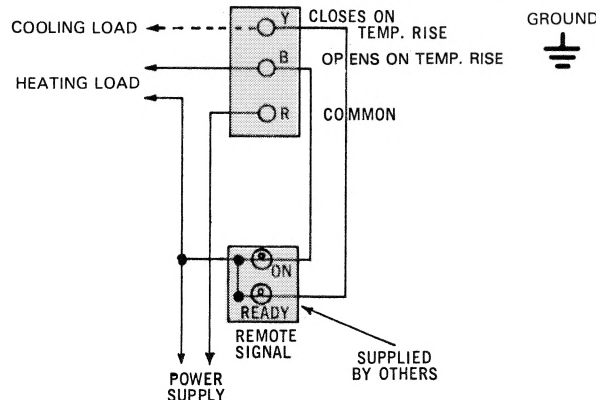


Figure 6 — Wiring diagram showing remote signal

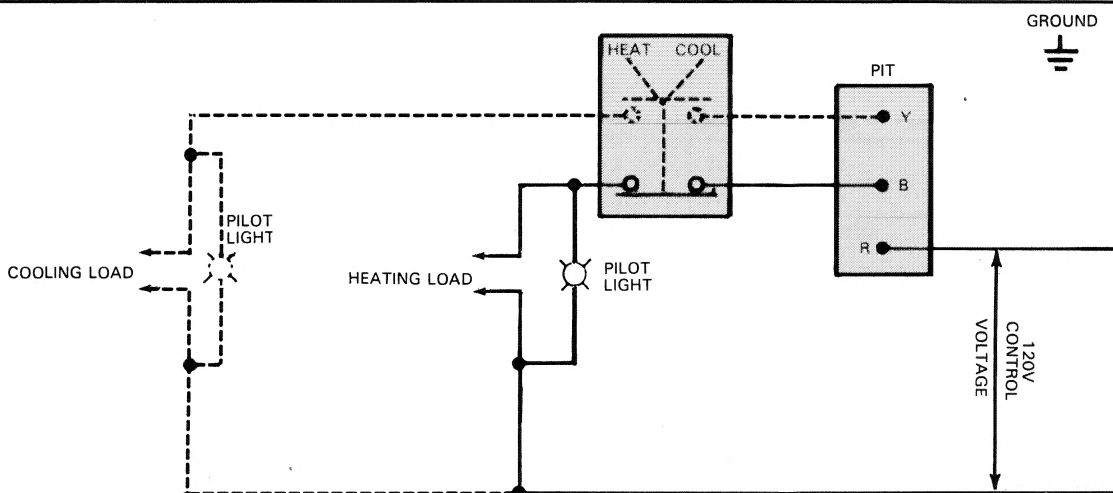


Figure 7 — Wiring diagram showing single phase load wired direct to control (load amperage or voltage does not exceed switch rating).

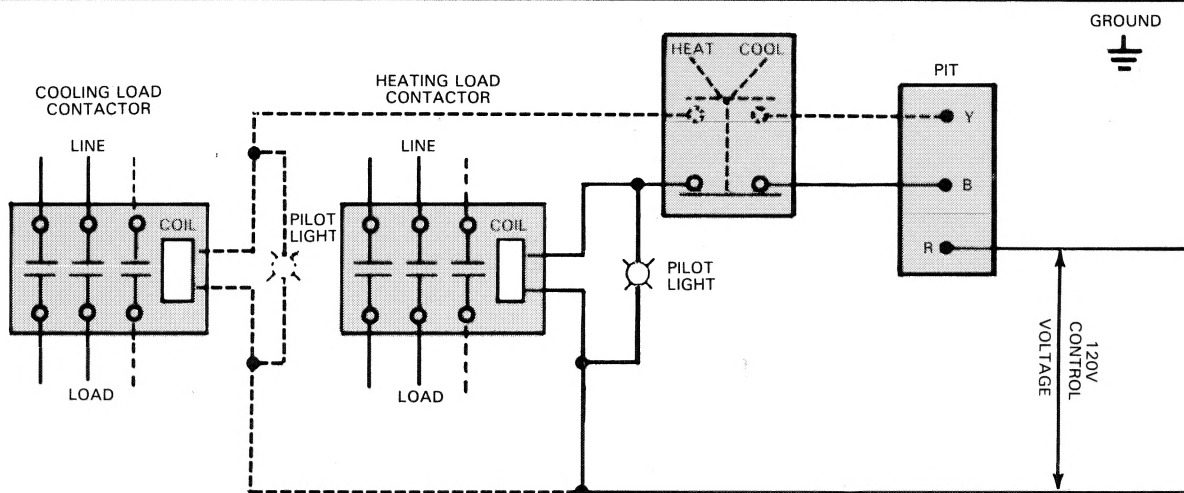


Figure 8 — Wiring diagram showing three phase or single phase where load ampere or voltage rating exceeds switch rating.

TESTING AND OPERATION

After installing and wiring, to check the operation of heating systems:

1. Disconnect power.
2. Place the heat/cool selector switch, if applicable, in the heat position.
3. Adjust the setpoint ten or more degrees below the temperature of the controlled space.
4. Restore power.
5. Slowly adjust the setpoint upward. When the setpoint reaches the approximate temperature of the controlled space, the heating equipment should start.

To check the operation of the cooling system:

1. Disconnect power.
2. Place the heat/cool selector switch, if applicable, in the cool position.
3. Adjust the setpoint ten or more degrees above the temperature of the controlled space.
4. Restore power.
5. Slowly adjust the setpoint downward. When the setpoint approximates the temperature of the controlled space, the cooling equipment should start.

The warranty below has been drafted to comply with the new Federal Law applicable to products manufactured after December 31, 1976. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. The warranty in no manner reduces the coverage provided to you under the warranty it replaces.

Chromalox Warranty: Chromalox industrial products are warranted against defects in workmanship and materials. NO OTHER WARRANTIES, WRITTEN OR ORAL, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND WARRANTIES FOR A PARTICULAR PURPOSE, APPLY. No person is authorized to give any other warranty or assume any other liability except by written statement from an officer of the Edwin L. Wiegand Division, Emerson Electric Co.

Warranty Period: This warranty extends for twelve months from date of shipment from factory or authorized distributor.

Limitations: Products must be installed and maintained in accordance with Chromalox in-

structions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from corrosion, misapplication, improper specification or other operating conditions beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

Remedy: Return the defective part or product, freight prepaid, to the location designated by Chromalox Product Service. All such items must be accompanied by a Material Return Authorization. This form, which includes a tear-out mailing and identification label, should be obtained from your local Chromalox Sales Office.

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